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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/908,884	08/08/1997	XINNIAN DONG	00786/339004	9977

7590 10/18/2002

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EXAMINER
KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
1638	34

DATE MAILED: 10/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	08/908,884	DONG ET AL.	
	Examiner	Art Unit	
	Anne R. Kubelik	1638	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-13,15-29,36 and 40-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-13,15 and 16* is/are rejected.

7)☒ Claim(s) *17-29, 36 and 40-42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *with the application* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *30* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The request filed on 11 April, 2002, for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/908,884 is acceptable and a CPA has been established. An action on the CPA follows.

2. The amendments to claims 10-12, filed in Paper No. 33, filed 16 July, 2002, have been entered. Claims 1-2, 4-13, 15-29, 36, and 40-42 are pending.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

4. The drawings are objected to for the reasons indicated on form PTO 948, sent with a previous Office action. Corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. See 37 CFR 1.85(a) and MPEP 608.02(b).

Specification

5. The disclosure is objected to because it contains embedded hyperlinks and/or other forms of browser-executable code. See, *e.g.*, pg 33, lines 24-25, pg 35, line 2, and pg 42, line 24. Applicant is required to delete the embedded hyperlinks and/or other forms of browser-executable code. See MPEP § 608.01.

6. The title of the invention is not descriptive of the instant invention. A new title is required that is clearly indicative of the invention to which the claims are directed. Note that titles can be up to 500 characters long.

7. The abstract is not descriptive of the instant invention. A new abstract is required that is clearly indicative of the invention to which the claims are directed.

Sequence Rules

8. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825.

Sequence identifiers are missing from the legends of Figures 6A and 6B.

Full compliance with the sequence rules is required in response to this Office action. A complete response to this Office action must include both compliance with the sequence rules and a response to the issues set forth below. Failure to fully comply with both of these requirements in the time period set forth in this Office action will be held to be non-responsive.

Information Disclosure Statement

9. The email message cited on the Information Disclosure Statement filed 13 May, 2002, as Paper No. 30, has been crossed out and not considered because it is not a publication.

Claim Objections

10. Claims 17-29, 36 and 40-42 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 112

11. Claims 1-2, 4-13 and 15-16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The rejection is modified from the rejection set forth in the Office action mailed 12 March, 2001, as applied to claims 1-2, 4-13, 15-29, 36 and 40-42. Applicant's arguments filed 11 May, 2002, and 16 July, 2002, have been fully considered but they are not persuasive.

The claims are broadly drawn to a multitude of DNA molecules that encode ankyrin-repeat-containing disease resistance proteins. In contrast, the specification only describes coding sequences from *Arabidopsis thaliana* that comprises SEQ ID NOs:1 and 2. Applicant does not describe other DNA molecules encompassed by the claims, and the structural features that distinguish all such nucleic acids from other nucleic acids are not provided.

Hence, Applicant has not, in fact, described within the full scope of the claims DNA molecules that that encode ankyrin-repeat-containing disease resistance proteins, and the specification fails to provide an adequate written description of the claimed invention.

Therefore, given the lack of written description in the specification with regard to the structural and physical characteristics of the claimed compositions, it is not clear that Applicant was in possession of the genus claimed at the time this application was filed.

Applicant urges that the Written Description Guidelines state that what is a representative number of species depends on whether one of skill in the art would recognize that Applicant was in possession of the necessary common attributes of the members of the genus. Applicant urges that because the shared characteristics (ankyrin-repeats) of the claimed acquired resistance genes are described, this standard is satisfied. Applicant urges that the claimed family of disease resistance proteins is readily distinguishable from unrelated ankyrin-repeat-containing proteins because they play a role in disease resistance (response pg 4-5).

This is not found persuasive because the specification does not teach the structural and functional features of the nucleic acids that encode ankyrin-repeat-containing disease resistance proteins that distinguish them from ankyrin-repeat-containing proteins that are not disease resistance proteins. What are the structural features that indicate that a given ankyrin protein-encoding nucleic acid encodes a protein that plays a role in disease resistance? The specification does not teach these; thus Applicant was not in possession of the claimed genus.

Applicant further urges that because acquired resistance is ubiquitous in plants and because an ankyrin-repeat-containing protein controls the onset of such a response in *Arabidopsis*, it is reasonable to assume that other plants possess such genes (response pg 5).

This is not found persuasive. A likelihood of the presence of a gene in other plants does not teach the structural and functional features of that nucleic acid.

Applicant urges that the Written Description Guidelines provide an example in which a group of mammalian sequences did not share a partial structure in common; in the instant case the common structural feature is the ankyrin repeat. Applicant urges that Bourgri et al (WO 00/70069) teach acquired resistance genes from several plant species; the genes share sequence homology in the region of ankyrin repeats with the *Arabidopsis* NPR1 protein, indicating that this structural feature is common to members of the genus (response pg 6-7).

This is not found persuasive. Example 17 of the Written Description Guidelines discusses a case where the specification teaches the nucleic acid that encodes the rat insulin, but where the claims are directed to the nucleic acid that encodes the human insulin. Note that rat and human insulin are highly similar - they share 86 identical amino acids over the 107 total length of the human protein - but the example states that possession of one DNA does not mean one has possess of the genus. The claims in that example, and the instant case, are drawn to the DNAs that encode those proteins. The structural features shared by those nucleic acids are not taught in the Written Description Guidelines example nor are they taught in the instant case. In Bourgri et al it is the proteins that share homology with the NPR1 protein in the region of ankyrin repeats; homology between the nucleic acids was not demonstrated.

12. Claims 1-2, 4-13 and 15-16 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for NPR1 coding sequences from *Arabidopsis* that comprise SEQ ID NOs:1 and 2, does not reasonably provide enablement for any nucleic acid that encodes an ankyrin-repeat-containing disease resistance protein. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The rejection is modified

from the rejection set forth in the Office action mailed 12 March, 2001, as applied to claims 1-2, 4-13, 15-29, 36 and 40-42. Applicant's arguments filed 11 May, 2002, and 16 July, 2002, have been fully considered but they are not persuasive.

The claims are broadly drawn to a multitude of nucleic acids that encode ankyrin-repeat-containing disease resistance proteins.

The instant specification, however, only provides guidance for isolation of the *Arabidopsis npr1-1, 1-2,* and *1-3* mutants, which have a block in induction of SAR, did not inhibit the growth of avirulent pathogens, and have reduced expression of PR genes (pg 21-23 and 24-32); map-based cloning of the NPR1 gene, SEQ ID NO:1 (pg 23 and 33-35); complementation of the *npr1* mutants (pg 35-41); isolation of an NPR1 cDNA, SEQ ID NO:2, which encodes SEQ ID NO:3 (pg 43-44); transformation of wild-type *Arabidopsis* with SEQ ID NO:2 expressed from the CaMV 35S promoter to show that plants that overexpressed the protein had increased resistance to bacterial and fungal pathogens (pg 44-46); a demonstration that NPR1 is translocated to the nucleus (pg 46-47); characterization of the *npr1* mutations (pg 47-48); and isolation of a *Nicotiana glutinosa* cDNA (SEQ ID NO:13) by hybridization with SEQ ID NO:2 (pg 49-50).

The instant specification fails to provide guidance for nucleic acids other than SEQ ID NOs:1 and 2 that encode ankyrin-repeat-containing proteins that confer disease resistance upon a plant. The instant specification fails to provide guidance for exact hybridization or amplification conditions and probes/primers to use in isolation of ankyrin-repeat-containing disease resistance protein encoding nucleic acids other than SEQ ID NOs 1 and 2.

The presence of an ankyrin repeat does not mean a protein plays a role in plant disease resistance. Sedgwick et al (1999, Trends Biochem. Sci. 24:311-316) teach the ankyrin repeats are found in a wide range of proteins, including inhibitors, developmental regulators, cytoskeleton organizers and toxins and that in most of these proteins ankyrin repeats are combined with unrelated structural modules (pg 311, column 3, paragraph 1). Ankyrin repeats appear to be involved in protein-protein interactions and not in the unique role of the protein (Sedgwick et al, paragraph spanning pg 311-312, and Cao et al, 1997, Cell 88:57-63, pg 61, left column, paragraph 3). The specification does not teach the other structural motifs that would enable one to identify which nucleic acids that encode ankyrin-repeat containing proteins encodes proteins that confer disease resistance upon a plant.

The specification fails to provide evidence that the *N. glutinosa* nucleic acid SEQ ID NO:13 encodes a protein that confers disease resistance to a plant expressing the protein and has a functional relatedness to the *Arabidopsis* NPR1 gene..

As the specification does not describe the transformation of any plant with any ankyrin-repeat-containing disease resistance protein encoding nucleic acids other than SEQ ID NO:2, undue trial and error experimentation would be required to screen through the myriad of nucleic acids encompassed by the claims and plants transformed therewith, to identify those with enhanced disease resistance, if such plants are even obtainable.

Given the claim breath, unpredictability in the art, and lack of guidance in the specification as discussed above, the instant invention is not enabled throughout the full scope of the claims.

Applicant urges that genes falling within the scope of the invention could easily be isolated using standard techniques of molecular biology and the guidance provided on pg 50-52 of the specification. Applicant urges that SEQ ID NO:13 is an NPR1 homolog isolated by these methods. Applicant also urges that it could easily be determined whether structurally related genes confer disease resistance by transformation into plants. Applicant urges that Bourgi et al (WO 00/70069) showed than such gene from rice and wheat conferred disease resistance in rice. As such, Applicant urges that there is no reason to doubt the existence of Applicant's claimed gene family. Applicant urges that there is no scientific evidence made of record that establish a basis for doubting the truth of applicant's statements (response pg 7-12).

This is not found persuasive. The existence of nucleic acids encoding NPR1 homologs in other plants is not questioned; Applicant's possession of nucleic acids encoding these homologs is. The specification does not teach structural motifs that would enable one to identify which nucleic acids that encode ankyrin-repeat containing proteins encodes proteins that confer disease resistance upon a plant. Applicant is encouraged to submit a declaration providing data that shows that SEQ ID NO:13, when transformed into a plant, confers disease resistance on the plant. The specification does not teach the sequence of the nucleic acids taught by Bourgi et al.

Claim Rejections - 35 USC § 102

13. Claims 1-2, 4-13 and 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ryals et al (US Patent 6,091,004, filed June, 1996). The rejection is repeated for the reasons of record as set forth in the Office action mailed 12 March, 2001, as applied to claims 1-2, 4-13, 15-

29, 36 and 40-42. Applicant's arguments filed 11 May, 2002, and 16 July, 2002, have been fully considered but they are not persuasive.

Ryals et al teach an isolated nucleic acid encoding SEQ ID NO:3 and of SEQ ID NO:1 (see SEQ ID NOs:2 and 3), chimeric genes comprising the NIM1 cDNA operably linked to the CaMV 35S promoter, and plants transformed with the vector, and methods of using the nucleic acid to enhancing disease resistance in a plant and to increase SAR in a plant (column 44, line 60, to column 46, line 27; claims 1-25).

Applicant urges that the priority document relied on by Ryals et al fails to disclose a DNA molecule free of other genes in the genome, as is claimed by Applicant's, and fails to disclose any isolated plant resistance gene sequence. Applicant has submitted a declaration by Dr. Xinnian Dong stating that prior to May 8, 1996, Dr Dong had isolated a YAC clone designated yUP19H6 in which the NPR1 gene resided (response pg 13-14).

This is not found persuasive because the Declaration of Dr. Xinnian Dong was not included with the response. Additionally, the Ryals et al reference is a U.S. patent or U.S. patent application publication of a pending or patented application that claims the rejected invention. An affidavit or declaration is inappropriate under 37 CFR 1.131(a) when the reference is claiming the same patentable invention, see MPEP § 2306. If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. See MPEP Chapter 2300 for information on initiating interference proceedings. If the reference and this application are commonly owned, the patent may be disqualified as prior art by an affidavit or declaration under 37 CFR 1.130. See MPEP § 718.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 1-2, 4-13 and 15-16 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-25 of copending Application No. 09/908,323. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: The claims of the instant application and the claims of the copending application are drawn to a nucleic acid comprising SEQ ID NO:1. Additionally, the claims of instant application are drawn to a DNA molecule encode a protein that comprise an ankyrin-repeat and that confer disease resistance on a plant, including nucleic acid s that hybridize to SEQ ID NOs:1,2 and 13; the claims of the copending application are drawn to species of this genus of nucleic acids. Thus, the instant claims are obvious in view of the claims of the copending application.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Conclusion

16. No claim is allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Anne R. Kubelik, Ph.D.
October 17, 2002